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Civil Engineering

WORKING IN THE OPERATIONS FLIGHT HEAVY REPAIR

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This volume in this pamphlet series describes the Air Force Engineer's role in activities required to operate, maintain, repair, and construct installation real property using an in-house military and civilian work force and recurring and nonrecurring service contracts. This volume provides detailed guidance for performing the Heavy Repair mission. The Heavy Repair Element accomplishes the majority of in-house large and multi-craft work orders, pest management, and all pavements and equipment work. This pamphlet series supports AFI 32-1001, *Operations Management*, as the AFI which implements AFPD 32-10, *Installations and Facilities*.

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Chapter 1 Introduction to the Heavy Repair Element

1.1 Organization and Function

The Operations Flight is responsible for all activities required to operate, maintain, repair, and construct installation real property. The Flight is composed of five elements to process requirements in an efficient and timely manner. These elements are Maintenance Engineering, Facility Maintenance, Material Acquisition, Infrastructure Support, and Heavy Repair.

AFPAM 32-1004 *Working in Operations Flight, Volume 6, Heavy Repair* is a guide to the mission, objectives, and management of the Heavy Repair Element of the Operations Flight. The Element accomplishes the majority of in-house large and multi-craft work orders, pest management, snow removal, and all pavements and equipment work. The pamphlet offers guidance by suggesting options and tools to successfully perform the mission. Successful alternatives to these suggestions are encouraged and authorized.

1.2 Mission Statement

The mission of the Heavy Repair Element of the Operations Fight, as stated in AFI 32-1001, *Operations Management*, is as follows

Heavy Repair's mission is to accomplish the majority of in-house large and multi-craft work orders and all pavements and equipment work, including facility renovation, alteration projects, all pavements, airfields, roads and sidewalks, sweeping, pest management, and equipment operations and repair

1.3 Objectives

The element has five overall objectives:

(1) maintain, repair, and modify real property;
(2) manage large multi-craft work orders;
(3) perform pavement work;
(4) perform equipment operations; and
(5) provide pest management.

The following is a brief review of these objectives and the sections in which they are handled. The first objective spans across the Element with large multi-craft work orders handled in the vertical section and pavement work, equipment operations, and pest management handled in the horizontal section. Chapters 2 and 3 are an in-depth look at the

horizontal and vertical sections; providing guidance and offering tools and suggestions that can be used to meet the objectives, thus fulfilling the mission of the Heavy Repair Element.

1.3.1 Real Property Maintenance, Repair, Alteration, and Construction (MRA&C)

Heavy Repair is responsible for both interior facility utility systems and structural components. MRA&C for facility components is inclusive of fire protection and low-voltage electrical gas, compressed air, and water distribution systems. The structural capability of the Heavy Repair Element includes the maintenance and repair of building components such as masonry, concrete, steel, plaster, ceramic and quarry tile, metal work, and floor and ceiling finishes. The ability to perform base-wide locksmith services and the maintenance of installed security vaults and safes is retained within Heavy Repair. MRA&C also applies to all airfield pavements, roads, sidewalks, parking areas, storm drainage, and ground maintenance.

1.3.2 Managing Large, Multi-craft Work Orders

The Heavy Repair Element serves as the Flight focal-point for the management and control of the majority of the large, in-house and multi-craft work orders. These work orders require:

(1) advance planning and
(2) the requisition of supplies not stocked or not stocked in sufficient quantities in the main store (see AFPAM 32-1004, *Working in Operations Flight, Volume 4 Material Acquisition*)

1.3.3 Performing Pavement Work

The Heavy Repair Element inspects and maintains the airfield pavement systems, ensuring flight operations are conducted safely and reliably. The highest priority is given to the inspecting, maintaining, and repairing. Flight facilities such as runways, taxiways, parking aprons, shoulders, and associated drainage systems. Within the recurring work plan, flight line sweeping, grounds pest control, and snow removal are scheduled and completed on a priority basis. Other base pavement is maintained according to the short-term and long-term pavement improvement programs.

1.3.4 Performing Equipment Operations

Managing, operating, and maintaining various types of heavy equipment and vehicles assigned to the Base Civil Engineer is another of the Heavy Repair Element's objectives. Special heavy equipment includes cranes, bulldozers, graders, backhoes, snow removal equipment, and high-reach lift trucks used in support of work by other Flight Elements and in direct support of pavement maintenance

and repair. Equipment operations is organized and managed as a separate horizontal section, allowing for the flexible scheduling and control of these assets.

1.3.5 Providing Pest Management

Responsibility for the inspection and performance of pest and vegetation control for all facilities and grounds, including military family housing (MFH) quarters. This includes performing inventory control and proper handling of herbicides, pesticides, and other hazardous materials used in structural, non-structural, and grounds pest control.

1.3.6 Heavy Repair, Vertical Section

The vertical section handles large, multi-craft work orders consisting of jobs requiring advance planning and advance acquisition of materials. It was created to perform these large jobs without the necessity to coordinate them among individual craft work centers. Because the amount and type of work which can be done is defined, it is possible to identify, on a month-to-month basis, the large-scale work orders which can be performed. Additional responsibilities include locksmith needs.

1.3.7 Heavy Repair, Horizontal Section

The horizontal section of the Heavy Repair Element is, itself, divided into three areas. Pavement work consists of maintenance and minor repairs or alteration to airfield pavements, roads, sidewalks, curbs, gutters, drainage ditches, and culverts. The second area, equipment operations, consists of the driving and operations of various types of heavy equipment. This is done either for work within the Flight or to fulfill requirements for other flights. The primary use of the equipment is in support of the maintenance, repair, and construction of real property assets. Additional responsibilities include managing the base pest control (entomology).

The Element is supervised by the Heavy Repair chief whose management team consists of a vertical chief and a horizontal chief. The Heavy Repair chief receives requirements from the Work Request Review Board (WRRB). These requests are passed to the vertical chief who schedules the request and assembles the requisite team to accomplish the work. Multi-craft work orders can, and often do, require the services and equipment from the horizontal section. Other work in the horizontal section is usually requested through a type of direct scheduled work orders

(DSWOs). The Heavy Repair chief provides the horizontal section with the required resources and manages the pavement program by exception.

Heavy equipment is organized as a separate sub-section of the horizontal section. This allows both flexibility and control of these valuable and, often, one-of-a-kind assets. The Heavy Repair chief supplies required resources and, through the Horizontal chief, ensures responsive scheduling and crew assignments and evaluates the quality of the work.

1.4 Manpower

Air Force Manpower Standard 44EO, *Manpower Standard Operations Flight*, details the manning for the Operations Flight. Using the detailed formulas and determining the applicable manpower ranges, manpower managers can consult the provided Standard Manpower Tables to identify the manning of the Heavy Repair Element needs.

While some command and base variations may make manning requirements unique, the Civil Engineer formed the original, typical Objective Squadron, Heavy Repair Element template to provide overall guidance on the numbers and types of Air Force specialties (AFS) authorized. The first CE Squadron chief master sergeant (CMSgt) position is earned in Heavy Repair and may be assigned the additional duty of advisor to the commander. (In larger squadrons, CMSgts may be earned in other flights and elements and provide alternate sources for the additional duty). The manpower table for Heavy Repair has three entries for MSgt. The 3EX7X is provided for supervision and career progression for those Air Force Specialty Code (AFSCs) on this table that do not have a designated master sergeant (MSgt) position. All 3E473s earned in this element are to be civilian except at those overseas locations where civilian positions are hard to fill. At those locations, one 3E473 requirement can be a military TSgt or MSgt.

1.4.1 Training

Manning levels and authorizations are based upon fully qualified personnel. The appropriate training prior to assignment is essential for acceptable work performance.

1.4.2 Enlisted Workforce

The requirement for having a military workforce is to meet the wartime contingency taskings. Each Major Command (MAJCOM) has a military strength distributed to each installation. There is some flexibility in the overall military-to-civilian mix based on the core AFS requirements (At-

tachment 2). Coordination with the MAJCOM and Resources Flight manpower person can assist in determining the right mix and numbers required to meet specific base needs.

1.4.3 Civilian Workforce

The Heavy Repair Element is comprised of a civilian and military work force which accomplishes operations, maintenance and repair, recurring work, and modifications to real property. This work force:

(1) provides a higher level of career field knowledge to supplement the senior enlisted force;
(2) provides continuity and stability at the installation during contingency exercises and deployments of military personnel;
(3) has specific duties and responsibilities during base exercises, military deployments, and natural disasters/emergencies; and
(4) provides training to the enlisted and the other civilian personnel.

The local Consolidated Personnel Center and Labor Management Agreement can give specific criteria for each of these instances. Most civilians hired are at the Journeyman level; however; in the future they may be hired as apprentices and intermediate level employees.

1.4.4 Multi-craft/Multi-skilling Initiative

The multi-crafting and multi-skilling initiatives were established as part of the DMRD 967. The purpose was to enhance the organization by gaining efficiency and productivity. The intent of multi-crafting was to create teams of skilled craftsmen with the purpose of quickly completing work assignments. Both multi-skilling and multi-crafting included using military and civilian personnel.

1.5 Matrixing

Productivity gains are achieved through matrixing. Matrixing is the movement of personnel within an element to support an identified shortage in a skill level, AFS, or specialized work task. Inspection of specialized service contracts is one example where craftsmen are used to augment quality assurance evaluators (QAEs) in the Maintenance Engineering Element.

The Working in the Operations Flight pamphlet is primarily a source of processes for accomplishment of the flight's mission. This volume lists processes for accomplishment of the Heavy Repair Element mission, including how it relates to other flights and other elements.

Chapter 2 Heavy Repair — Vertical Section

2.1 The Vertical Section

The vertical section of heavy repair carries out the scheduling, ordering, assignment, supervision, work, and evaluation of large, multi-craft work orders. In defining the need for this section, *Operations Management*, adopted the outlook that these types of work orders could be better handled by a single control center.

The division of responsibilities within the Heavy Repair Element is consistent with the objectives of the Operations Flight as stated in AFI 32-1001, *Operations Management*. This reads, in part, "…to accomplish the mission most economically… provides base support services (i.e., pest control… snow removal…)… Accomplishes work requirements quickly…[and] Develops work plans to effectively allocate in-service resources including people, facilities, equipment, and vehicles to meet mission and customer needs…"

2.2 Multi-craft Work Orders

2.2.1 Definition

The multi-crafting, multi-skilling initiatives were established as part of the DMRD 967. The purpose was to enhance the organization by gaining efficiency and productivity while the workforce was undergoing reductions in force (RIFs). The definitions of multi-task and multi-skilled personnel were determined by a group of AF Civil Engineers.

Multi-craft personnel are defined as journeymen or extended journeymen specialists. The limited journeymen specialists assist other specialists in separate technical fields. For example, a plumber assists an electrician in the installation of a lighting system. The extended journeymen specialists have expertise in one skill area and general knowledge in other skill areas. For example, a plumber replaces a wall-mounted water cooler, reconnects the power source, and refinishes the wall.

The intent was to provide multi-skilled teams to quickly and efficiently accomplish work requests.

A multi-craft work order is defined as "large" or "small." Small work orders are routinely handled by a Facility Maintenance work center. Facility maintenance managers meet with facility representatives and record minor maintenance and repair items. Whether or not the Facility Maintenance can meet the request requirements from within determines the size of the job. The facility maintenance manger determines if the work can be done with available manpower and available man hours and with the skill level capability necessitated by the request.

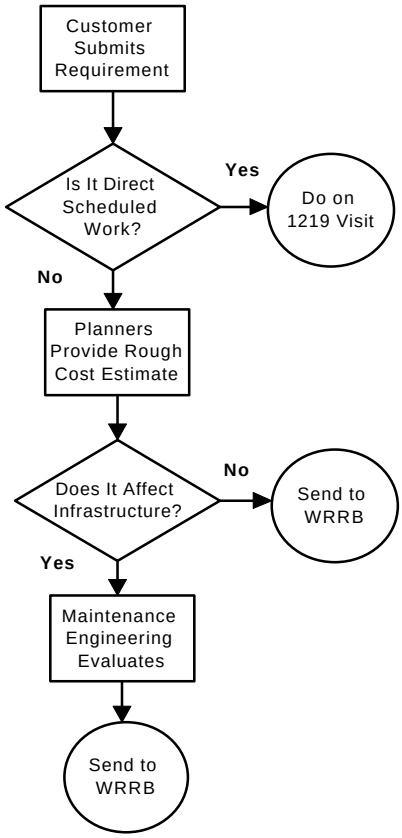
Large, multi-craft work orders are requests that cannot be met by the maintenance facility maintenance managers with the resources available to them. Large requests require advance planning. Frequently, they require advance acquisition of materials needed for the job. These are items not currently stored or stored in insufficient quantity for the job.

By putting all the required resources together in the vertical section of the Heavy Repair Element, it became possible to complete the large, multi-craft requests without the need to coordinate the efforts of individual craft work centers. This also made it possible, by the advance planning and scheduling of these large tasks, to define for customers the capacity of Heavy Repair to perform the work on a month-by-month basis. The capacity of the section is fixed and the length of each job and required resources can be accurately projected.

2.2.2 Processing a Request

All work requirements, including large, multi-task work orders, are received from a customer at the work center service desk. The facility maintenance manager and supervisor determine whether the requirement can be met through a direct scheduled work order (a complete explanation of how requests are evaluated and processed in the Facility Maintenance Flight, is given in AFPAM 32-1004, *Working in the Operations Flight, Volume 3 Facility Maintenance*, Chapter 5). Figure 1, Work Order Review and Evaluation, provides a visual overview of the request evaluation process.

Figure 1. Work Order Review and Evaluation



Work beyond the scope of the work center is sent to the WRRB. If it can affect a base infrastructure, which most large jobs do, the request is estimated and then sent to Maintenance Engineering for evaluation prior to review by the WRRB.

The request is given to the program engineer within the Maintenance Engineering Element responsible for the affected infrastructure program. The engineer prepares an evaluation, answering the questions:

(1) Does the work meet the customer's needs?
(2) Does the work affect the infrastructure program positively or negatively?
(3) Does the work duplicate or negate other planned work, especially in the long-range plan?
(4) How will the work be done?
(5) Is the work valid? This is a recommendation of approval or disapproval for the work, by the engineer, made to the WRRB.

Organizations may differ in how the process of planning a work request is done. It can also be done at the work center level or through an organized planning section. However, at the point where the request is planned and a cost estimate developed, it is essential a clear understanding of the request be documented. Coordination with the requester and, at the direction of the CE, other agencies is very important.

After the program engineer's review, the Maintenance Engineer, who is a member of the WRRB, also reviews the work order and prepares a recommendation for the WRRB.

When presented to the WRRB, the request is accompanied by the cost estimate and evaluations and method of accomplishments by Maintenance Engineering.

The Board, chaired by the Base Civil Engineer, includes the Heavy Repair force manager who is the focal points for WRRC, the Maintenance Engineer, and other required parties. The work order is reviewed with particular attention paid to the recommendations. There are two outcomes: approval and disapproval.

When the WRRB disapproves a request, it is usually because the requirement does not carry a high enough priority or the WRRB determines the work was not required. Other reasons for disapproval include lack of resources, lack of available funds, out of compliance based on policies, exceeding minor construction (MC) limitations, and it could/would have a negative environmental impact. It is the responsibility of the facility maintenance manager to notify the customer of the WRRB's decision, provide an explanation for denial, and, if asked by the customer, put them in touch with the decision-making personnel.

The Board, when it approves a work order, gives it a priority, determines how it will be accomplished, and either performs or verifies coordination. If the work is to be accomplished in-house, it is sent to the vertical section of Heavy Repair.

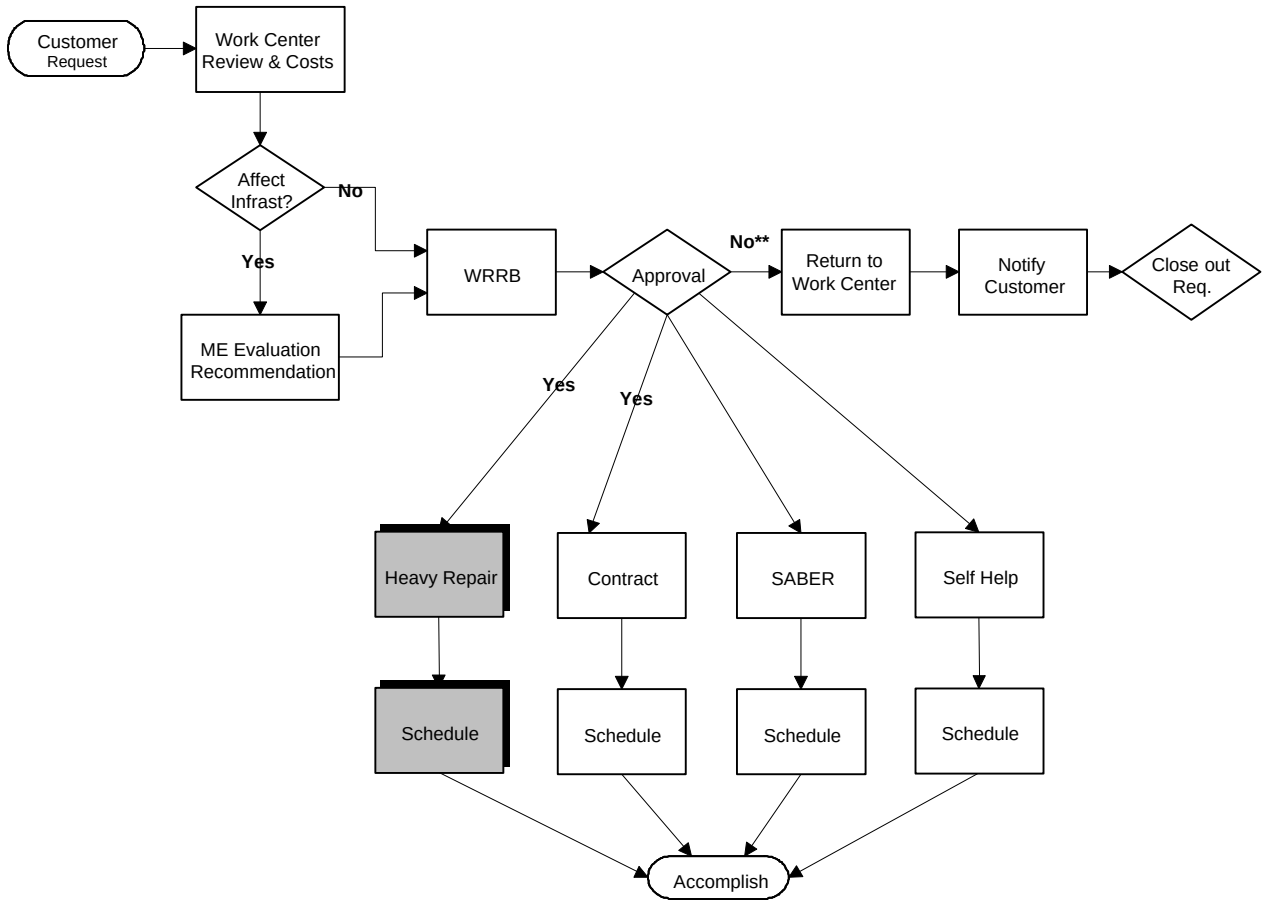
The entire review process, from customer request at the work center through the WRRB, is graphically depicted in Figure 2, Work Request Evaluation and Review Process.

2.2.3 Accomplishing the Work

Once a large, multi-task request is approved to be done in-house by the WRRB, it is given to the Heavy Repair chief.

The chief schedules the request based upon priorities set by the WRRB. Base on the current workload of the vertical section, the planning time required, and material acquisition time; the chief sends it to the vertical section.

Figure 2. Work Request Evaluation and Review Process



* Work may be disapproved because it:
(1) exceeds resource capability,
(2) is not based on policy,
(3) funding is not available, and/or
(4) there are environmental impacts.

** The Work Center chief is responsible for providing the information back to the customer. Work Centers are the single point of contact for the customer. The customer may elect to request additional information from the decision-making personnel. It is the Work Center's responsibility to put them in contact with the right people.

From the vertical chief, the request is passed to a journeyman craftsman who is tasked with:

(1) determining how to accomplish the work;
(2) preparing a sketch and work description, if required;
(3) preparing a bill of materials; and
(4) returning the package to the chief.

In determining how the work is to be accomplished, the journeyman needs to coordinate with the customer and draw on his own knowledge of methods.

The package returned to the vertical chief contains sketches; a bill of materials; the customer request; and a brief, narrative description of the work required. The work is checked by the chief who forwards the bill of materials to the Material Acquisition Element.

2.3 Work Order Flow

A planner or work center personnel forwards an approved work request to the responsible person in operations who establishes a work order folder containing the documentation required to authorize work. A planner or authorized work center personnel plans the work using established procedures, determines if funds are available for material purchases, and enters the required delivery date (RDD) in Civil Engineer Material Acquisition System (CEMAS).

2.3.1 Assigning a Required Delivery Date

A required delivery date is the date the material is required, as determined by the planner, and not a pre-selected number of days based on the work priority. The firm simulation program provides a recommended RDD based on past delivery time of items on the bill-of-material. Operation Flight personnel should review this data when assigning the RDD. By establishing RDDs in this way, Material Acquisition personnel can better determine actual priorities for material ordering and follow-up criteria.

The assignment of the RDD authorizes funds commitment. Funds are moved into memo committed status and held based on estimated material cost (calculated by internal ordering programs). Notification for Material Acquisition to order material is done when assigning the RDD. This places the requirement in the Logistics workload package. Work Information Management System (WIMS) tracking indicators identify work orders tracked to Material Acquisition awaiting materials.

2.3.2 Bill-of-material Requisitions

Material Acquisition personnel perform required research and firm the bill-of-material. If assets are not available for transfer action, CEMAS will generate the appropriate requisition documents, as determined by the source of supply. An AF Form 2005, Issue/Turn-In Request (SBSS), a buyer's abstract, or a contractor operated Civil Engineer supply system (COCESS) abstract will be produced on-line for all items ordered, except those ordered as routine. Routine requisitions are produced during end-of-session processing. The firm summary report and the bill-of-material item listing are also created during the firming process.

2.3.3 Monitoring Work Orders

Material Acquisition personnel build and keep a material documentation folder (MDF). When bills-of-material are firmed, they ensure a copy of the firm status report and item listing is placed in the MDF. Each work order has a material folder that is monitored and in which requisition documents are filed. Minimum documentation requirements include all store, residue, and holding area issues resulting in monetary charges to the work order at the time of close out. The individual who receives the property signs each issue document.

When all items are received, Material Acquisition personnel:

(1) review the bills-of-material and notify the planner or work center supervisor of the complete status,
(2) ensure all required updates have been completed on material complete work orders, and
(3) review a copy of the completed bill-of-material to ensure all required items are on hand and have valid holding area locations.

If the required quantities are not on-hand or locations have not been assigned, Materials Acquisition takes the required action.

After completing necessary updates, at least one copy of the bill-of-material is printed and placed in the MDF. This copy of the bill-of-material provides a method for the issue of materials during post-post operations.

If the holding area is not located near the work order files, a second copy of the bill-of-material is forwarded to the holding area and a file of material complete work orders is created for the post-post issuing of material. During the creation of this file, procedures are developed to purge it as

work orders are closed. A planner or work center personnel will be notified when work orders are material complete by using WIMS tracing indictors or local reports.

2.3.4 Material Review

Material reviews are performed by a planner or work center personnel according to AFI 32-1001. The Operations Flight chief and the chief of Material Acquisition document and coordinate procedures for these reviews. The minimum review should include checks to ensure all items are on-hand and are adequate in type and quantity to complete the task.

2.3.5 Scheduled Work

When work is scheduled, work center personnel performing the work will draw the material from the Material Acquisition holding area. Material Acquisition will process issues for all materials listed on the work order. When work center personnel receive the property, they sign the issue document and it is placed in the appropriate MDF. When all work is completed and excess material has been turned into Material Acquisition, work center personnel prepare the work order for close out and notify Material Acquisition.

NOTE

A work order cannot be closed out in WIMS until after the bill-of-material is closed out in CEMAS. This edit prevents Material Acquisition from having excess material on hand or on order for closed work orders

2.3.6 Work Order Close-out

Material Acquisition personnel run the work order close-out program in CEMAS for all work orders requiring close out. This program produces either an interim or final close-out. An interim close-out notice may require action to be taken (for example, turn-in of material from holding area, request cancellation of item from supply or contracting). Once all actions have been taken, a final close-out report is produced. The final close-out report shows all items issued, monetary charges, and total dollar values for each work center. Material Acquisition personnel will ensure the required documentation is complete and the person receiving the property signs the issue document. Upon completion of required validations, Material Acquisition personnel will forward the material documentation folders to operations for final close-out actions.

Operations Flight personnel combine the material documentation folder and work order folder into one folder

containing all documentation pertaining to the completed work order. Material documentation is part of the completed work order package and is kept for the required retention period in operations. Documents for direct scheduled work orders should only be retained if capitalization is required.

The vertical chief is responsible for scheduling the work. The availability of an appropriate crew is verified and discussed with the journeyman who planned the work. The journeyman then discusses the schedule with the customer. Once the agreed start date arrives the work is started with the journeyman supervising the crew.

Crew — The work crew consists of personnel with a reasonably close match of skills for the job. Some variation is acceptable. To attempt to get the perfect match could slow the completion of the work. The number of personnel in the crew is sufficient to permit the schedule to proceed according to plan. The crew is trained to work together as a team performing multi-craft work. Responsibility is shared and the focus of the team effort is output. It is the responsibility of the journeyman to keep in close contact with the customer throughout the performance of the job. This regular contact ensures the job is completed to the customer's satisfaction.

Work Completion — Upon completion of the job, the journeyman returns the work package to the vertical chief. At this time, the work package consists of red lined as-built drawings, a bill of materials, the customer request, and a brief narrative description.

The vertical chief verifies the work performed. This includes ensuring the customer is satisfied with the work, the work was performed professionally, and materials ordered for the job were either used or returned to inventory. Jobs should be carefully planned to minimize returns. When appropriate, any returned materials should be used on the next job.

When the vertical chief completes the verification, the work package is forwarded to Resources Flight for capitalization. Resources accounts for the costs incurred on the job, verifies the accounting codes, and, where applicable, confirms reimbursement codes. (Reference in AFPAM 32-1010 *Working in the Resources Flight, Volume 3 Financial Management*) Attachment XX.

Once Resources Flight completes its work, the package is forwarded to Maintenance Engineering. There, changes are made to record drawings and the impact on the recurring work program. Maintenance Engineering also carefully checks the work methods used on the job for any opportunity of potential improvement (See AFPAM 32-1004, *Working in Operations Flight, Volume 2 Maintenance Engineering*, chapter 8).

Finally, the work package returns to the vertical chief for close-out. Once the chief verifies all actions are complete, the production control specialist is directed to close the work order. The work is complete.

2.3.7 Regulatory References

In processing and performing large, multi-craft work orders, Heavy Repair is subject to the regulation defined in AFI 32-1001, *Operations Management*. In giving responsibility for these orders to Heavy Repair, it defines requirements for:

(1) coordinating the work with appropriate agencies including the fire Department, the safety office, base bioenvironmental engineer, and environmental;
(2) obtaining the approval and assignment of priority in a timely fashion;
(3) planning; and
(4) changing orders if the work is likely to exceed the approved cost, the scope of the work is changed, and/or there are additional minor construction requirements.

2.3.8 Involvement of the Operations Flight

The process of completing large, multi-craft work orders involves personnel throughout the Operations Flight.

The Operations Flight chief participates on the WRRB and either approves work orders or delegates that authority.

The first element to become involved with the large, multi-craft work order is Facility Maintenance. Work centers re-

ceive the customer request. Facility maintenance managers meet with customers to verify work requirements, process the work order, and estimate the job cost. Work affecting the infrastructure is forwarded to Maintenance Engineering. All other requests go directly to WRRB. The work centers also provide follow-up customer service information to the customer. If a work request is refused by the WRRB, it is the responsibility of the work center to notify the customer and explain the reasons behind the refusing the request. As the point-of-contact for the customer, the work center customer service unit (CSU) puts the customer in contact with the appropriate decision-makers if the customer requests additional information.

Maintenance Engineering accomplishes the following upon receipt of a work request:

(1) a method for accomplishing the work is proposed,
(2) they convene and run the WRRB, and
(3) update drawings during the close-out process.

The Heavy Repair Element, in coordination with the customer, plans the work, orders materials, and schedules, and performs the work.

2.3.9 Involvement Outside the Operations Flight

Personnel and organizations involved in large, multi-craft work orders outside the Operations Flight include the WRRB, BCE, senior base leadership, and the customer.

Other members of the WRRB, not yet mentioned in this Volume, are: the base bioenvironmental engineer representative; the environmental department representative; and a representative from the fire department, safety department, and engineering.

The BCE chairs the WRRB and briefs senior management on the status of the work. Senior base leadership prioritizes their work inputs and participates in the overall work prioritization effort.

The most important person involved in the effort is the customer. The customer works with the WRRB to ensure proper priority is placed on their request. The customer also works with the Heavy Repair vertical chief during planning and construction to ensure the work meets their requirements.

2.4 Locksmithing

A base's locksmithing capabilities are located in the vertical section of the Heavy Repair Element. The locksmiths install, repair, and/or replace all base locks, repairs real property installed safes and vaults, and make keys as required.

Chapter 3 Heavy Repair — Horizontal Section

3.1 The Horizontal Section

The horizontal section of the Heavy Repair Element has two major sub-sections: pavements and heavy equipment.

Combining pavement work and equipment operations within a single section makes it possible to perform work expeditiously, without requiring external coordination. Smaller work requirements can be performed under operations and can be internally approved.

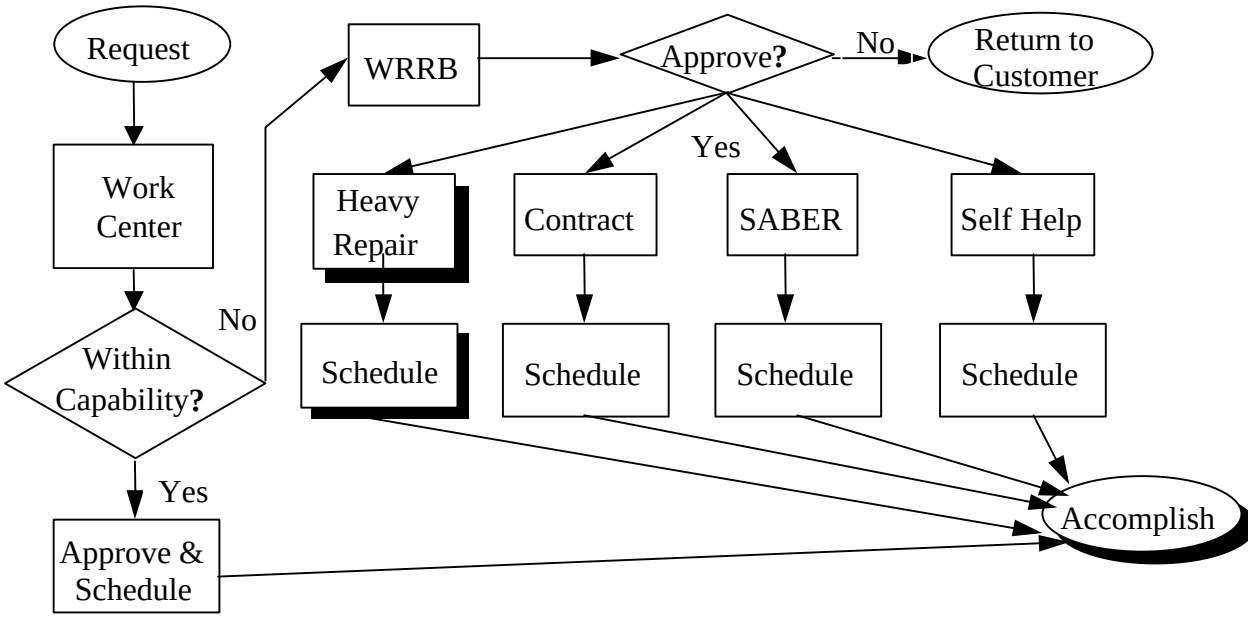
3.2 Pavement Work

Depending on the scope of the work required, pavement work is divided into two categories: operations and programmed work orders.

Operations are small items of work charged to a common work order (Collection Work Order Number). They are usually items internally identified, approved, and performed requiring minimum tracking.

This work flow process is shown in Figure 3, Horizontal Section Work Flow. Pavement work usually consists of the maintenance, repair, and/or alterations to airfield pavements, roads, sidewalks, curbs, gutters, drainage ditches, and culverts.

Figure 3. Horizontal Section Work Flow



The collective work order is similar to the direct scheduled work order (DSWO) (see AFPAM 32-1004, *Work in Operations Flight, Volume 3 Facility Maintenance*). The collective work order differs from the DSWO in that:

(1) a separate computer entry or paperwork is not required for each item,
(2) work is directly charged to operations, and
(3) cost accounting is done on a large scale (not by job) and by class pavement (e.g., runway, taxiway, base streets).

Larger items of work are performed under large, multi-task work orders (see Chapter 2). Both the personnel who operate the heavy equipment and the equipment are planned, scheduled, and costed as part of the larger work requirement.

3.2.1 Regulatory Requirements

AFI 32-1001, *Operations Management* states that required pavement work be accomplished in the Heavy Repair, horizontal section. As such, Heavy Repair is responsible for all in-house pavement work. As previously discussed (Chapter 2), the instruction also provides the procedures required to accomplish large, multi-task work orders.

The AFMS 44EO, *Manpower Standard Operations Flight* describes the work to be done. It also specifically excludes above 250 man-hours per undertaking; airfield rubber removal; and marking of parking lots, streets, and airfield pavement.

3.2.2 Operations Flight Personnel Involvement

Most of the personnel involved with the process of undertaking and accomplishing paving tasks are in the horizontal section of the Heavy Repair Element. The Operations Flight chief is responsible for providing the required resources and managing the pavement program by exception.

The horizontal chief schedules and tracks work, makes work crew assignments, evaluates the quality of the work, and coordinates the work with the customer.

Other personnel from the horizontal section include:

(1) the craftsmen who perform the work and report to the chief and
(2) the comptroller who charges time to the appropriate facility or pavement category and accounts for the craftsmen's time.

3.3 Heavy Equipment Operation

Equipment operation consists of driving and operating the various types of heavy equipment available for pavement jobs and large, multi-skill work orders. Occasionally, organizations outside of the Operations Flight will require equipment and operator support.

The primary purpose of equipment operations is in support of maintenance, repair, and construction of real property assets. This includes snow removal, discussed in section 3.4, at bases where the climate requires this service. Grounds maintenance is not included. To facilitate flexibility in the scheduling and control of these unique assets, they have been organized in a separate section of the Heavy Repair Element.

3.3.1 Work Flow

Work flow in heavy equipment operations is very simple. All work is charged to a common work order (Collection Work Order Number). The work is identified, approved, and performed internally and requires minimal tracking.

3.3.2 Regulatory Authority

The regulatory authority for equipment operations is found in AFI 32-1001, AFMS 44EO, *Manpower Standard Operations Flight*, and AFOSH Standard 91-46, *Materials Handling.* AFI 32-1001 provides guidance by stating Heavy Repair, horizontal section has responsibility for all in-house equipment work. Also, this equipment work is described as operations; thus, defining how accounting should be handled. The AFMS describes work included and specifically excludes:

(1) equipment operation in support of base activities and
(2) performing operator maintenance on the equipment.

3.3.3 Operations Flight Involvement

The majority of personnel involved in equipment operations is within Operations Flight and almost completely within the Heavy Repair Element. Involvement from outside the Flight is minimal.

The Operations Flight chief has overall responsibility for providing the required resources. The equipment operations program is managed by exception.

Within the Heavy Repair horizontal section, the horizontal chief schedules and tracks work, makes crew assignments, evaluates the quality of the work, and coordinates work with customers when necessary. The craftsmen perform the work and report to the chief. The comptroller charges time

to the appropriate facility and accounts for the craftsmen's time.

3.4 Snow Removal

Climatic conditions on some bases require preparedness for snow removal capability. On those bases, where snow removal could be required, Heavy Repair Element's horizontal section is responsible.

> **NOTE**
> Air Force policy, techniques, and procedures for snow and ice removal and ice control are set in AFR 91-15, Snow and Ice Removal and Control.

Availability of equipment designed or adapted for snow removal, personnel trained to operate the equipment, and planning and budget for the contingency are the responsibility of the horizontal chief. Planning for snow removal would be contingent on the estimated frequency of occurrence based on experience, amount of time required to accomplish the tasks, and man-hours and equipment needed to accomplish the task in a timely manner. It is mandatory the mission or base readiness to respond not be compromised.

All planning is reviewed by the Heavy Repair chief, who ensures adequate training is provided to employees charged with snow removal.

The chief of the Operations Flight is responsible for providing necessary resources to accomplish the task.

3.5 Entomology (Pest Management)

Entomology (pest management) is a requirement, responsibility, and necessity on every base. The development and implementation of a pest management program is typically handled within Heavy Repair.. AFI 32-1053, *Pest Management Program,* gives responsibility and provides procedures for pest management at AF installations and other operating locations. DoDI 4150.7, *DoD Pest Management Program,* implements policy, assigns responsibility, and prescribes procedures for the DoD pest management program.

NOTE

Additional information on many current pest management topics is available from AFCESA/CESM, 139 Barnes Drive, Tyndall AFB (DSN 523-6459). Much of the information (including contracting and self help pest control) is readily available on the internet at http://www.afcesa.af.mil/AFCESA/TechSupport

The Air Force pest management mission is to prevent pest and disease vectors from adversely affecting military operations or missions by establishing and maintaining safe, effective, and environmentally sound integrated pest management (IPM) programs. Entomology is responsible for developing guidance and criteria on pest management and providing consultation to the Air Force organizations on pest management. Pest management works with the natural resources office to control insects, rodents, snakes, birds, and other animals. A high priority on every base is pest control through minimal use of chemicals; especially herbicides and insecticides. The authority for the pest management program is found in AFI 32-1053, *Pest Management Program*. The Air Force installation pest control supervisor is responsible for the pest control program.

3.5.1 DoD Pest Management

DoD 4150.7, *DoD Pest Management Program* charges the Section of the Air Force to "…maintain a large - area, fixed wing aerial pesticide application capability to control disease vectors, pest organisms, and vegetation and to treat oil spills in combat areas, in DoD installations; or in response to declared emergencies and shall provide sufficient training for aerial pesticide application air crews and ground support personnel." (Information on this topic in AFR 91-22 will soon be replaced with AFI 32-1074, *Aerial Application of Pesticides*.) Other information on the DoD Pest management Program is available in DoDI 4150.7.

The Defense Pest Management Information Analysis Center (DPMIAC) is operated by the Board. Established in 1962, it is a military entomology and pest management information database. This automated data base provides support to coordinators in the form of data retrieval and the issuance of Disease Vector Ecology Profiles (DVEP) and Technical Information Bulletins (TIB) for pest management professionals. DPMIAC, a 24-hour service through the Internet, is staffed by civilian and commissioned military

entomologists and a civilian technical staff providing operational support.

3.5.2 Integrated Pest Management

The shift in the Air Force is away from traditional pest control programs and toward the IPM approaches. Traditional pest control was based in large part upon heavy applications of pesticides, usually, as a preventative measure. IMP uses regular monitoring to determine the extent of the problem and emphasizes the use of non-toxic, environmentally-safe means of control. Treatments are timed and selected so that there is the least possible interference with natural pest control.

The IMP is a direct result of the implementation of the directives found in DoD 4150.7. IMP is established as the policy of DoD. The heads of DoD components are directed to emphasize IPM techniques; ensure the implementation of IPM in pest management programs, operations, regulations, publications, training, and certification programs; monitor pesticide purchases; and bring about a reduction of its use.

3.5.3 Pest Management Plan

The pest management plan is a key component of an installation's pest management program. The basic elements of every plan as they apply to each installation are defined in Encl 8 to DoDI 4150.7. Installation pest management plans may be in an alternate format if the appropriate MAJCOM grants approval.

3.5.4 Certification of Pesticide Applicators

DoD 4150.7-P updates the procedures to train and certify pesticide applicators. The installation pest control supervisor is responsible for scheduling all individuals needing certification or recertification training. Certification of individuals is performed by the appropriate MAJCOM certifying official.

Legal authority for the training program is FIFRA, 40 CFR, Part 171 and 42 FR 41907 - 41908. The implementing regulations are:

DoD Instruction 4150.7, April 22, 1996 (reference (e)) *Department of Defense Pest Management Program*;

Air Force Regulation 91-22/Army Regulation 40-574, April 26, 1976, *Aerial Dispersal of Pesticides*;

NOTE
AFR 91-22 will soon be replaced by AFI 32-1074, *Aerial Application of Pesticides*.

and Air Force Instruction 32-1053, May 10, 1994, *Pest Management Program*.

Certification of any DoD employee can be denied, suspended, or revoked if that employee violates any provision of FIFRA or falsifies records.

DoD offers certification in several EPA categories to meet the specific requirements of pesticide use. These categories are shown in Table 1, EPA/DoD Pest Control Categories.

Table 1. EPA/DoD Pest Control Categories

Pest Control Category	EPA/DoD Category
Forest pest control	2
Ornamental & turf pest control	3
Soil fumigation pest control	3a
Aquatic pest control	5
Right-of-way pest control	6
Grassland and non-crop agricultural land pest control	6a
Industrial, institutional, structural, health related pest control	7
Stored products fumigation pest control	7a
Public health pest control	8
Demonstration & research pest control	10

Individuals who desire certification must satisfactorily complete a core training program, training in specific pest control categories, pass a written exam, and demonstrate competency.

WILLIAM P. HALLIN, Lt General, USAF
DCS/Installations and Logistics

Attachment 1 Glossary of References and Supporting Information

References

42 FR 41907-41908
ACCI 32-16, *Operation and Maintenance of Aircraft Arresting System*
AFI 32-1001, *Operations Management* (replaces AFI 32-1031)
AFI 32-1043, *Managing Aircraft Arresting Systems*
AFI 32-1053, *Pest Management Program*
AFI 32-1074, *Aerial Application of Pesticides*
AFMC, *Infrastructure Condition Standards*
AFMS 44EO, *Manpower Standard Operations Flight*
AFPAM 32-1004, *Working in Operations Flight Volume 4 Material Acquisition*
AFPD 32-10, *Installation and Facilities*
AFR 91-15, *Snow and Ice Removal and Control*
AFR 91-22/AR 40-574, Arial Dispersal of Pesticides
DMRD 967
DoD 4150.7-P
DoDI 4150.7, *DoD Pest Management Program*
FIFRA, 40 CFR

Abbreviations and Acronyms

3E5X1	the engineering AFS
A/C	air conditioning
A-76 Action	Process, under OMB Circular A-76, under which core responsibilities are contracted
AAFES	Army and Air Force Exchange Service
A&E	architect and Engineer - most commonly referring to the contract firms
ABO	air base operability
ACES	Automated Civil Engineer System
ADD	agreed delivery data
AF/CE	Air Force/Civil Engineer
AFCESA	Air Force Civil Engineer Support Agency, Tyndall AFB FL
AFFF	Aqueous film forming foam - the fire-fighting agent often used in hanger systems
AFI	Air Force Instruction
AFIT	Air Force Institute of Technology, Wright Patterson AFB OH
AFMAN	Air Force Manuals
AFMS	Air Force Manpower Standard
AFO	Accounting & Finance Office
AFP	Air Force Pamphlets
AFS	Air Force specialty (formally called AFSC - AFS Code)
AKA	also known as
BBE or BEE	Base Bio-Environmental Engineer
BCAS	Base Contracting Acquisition System
BCE	Base Civil Engineer
BCP	Base Comprehensive Plan (replaced by the Base General Plan)

BEAMS	Base Engineer Automated Management System - an older CE database system
BEE	base bio-environmental engineer
BPA	blanket purchase agreement
BTU	British thermal units - a measurement of energy
BUR	built-up roofing system
CA/CRL	custodial account/custody receipt listing
CADD	computer aided design and drafting, a computer-based program that organizes drafting and design functions to produce high-quality facility drawings.
CALT	contracting administrative lead-time
CAS	Condition Assessment Survey, a DoD program to objectively assess and evaluate DoD facilities for developing CAS
CATV	cable television
CBA	cost/benefit analysis
CDR	contract deficiency report, a report of substandard contract performance
CDS	career development center
CE	Civil Engineer
CEC	office symbol for the CE Engineering Flight
CEMAS	Civil Engineer Material Acquisition System
CFA	Commanders' Facility Assessment (replaced by Facility Investment Metric)
CFETP	career field education and training plans
CIAPS	Customer Integrated Automated Procurement System
CMSgt	chief master sergeant
COCESS	Contractor Operated Civil Engineer Supply Store
CSL	CEMAS Stock List Number
CSU	customer service unit
CWM	cost work order materials
CWON	Collection Work Order Number
DC	direct current
DDC	direct digital control
DIFM	due in from maintenance
DIN	do it now
DIRK	direct input reject key
DoD	Department of Defense
DOLI	date of last inventory
DOLT	date of last transaction
DPMIAC	Defense Pest Management Information Analysis Center
DRMO	Defense Reutilization Marketing Office
DSWO	Direct Scheduled Work Order
DVEP	Disease Vector Ecology Bulletins
ECIP	Energy Conservation Investment Program
EDD	estimated delivery date
EEIC	Element Of Expense/Investment Code
EMCS	Energy Management Control System
EMIS	Environmental Management Information System
EOD	end of day
EPS	Engineering Performance Standards

ESPC	Energy Savings Performance Contract
FAD	force activity designator
FAR	federal acquisition regulations
FCA	fund cite authorization
FEDLOG	Federal Logistics Data
FEMP	Federal Energy Management Program
FIM	Facility Investment Metric
FOB	found on base
FSC	Federal Supply Class
FSDC	Fire Safety Deficiency Code
GIS	graphic information system, a linking of database data with CADD drawings
GOCESS	Government Operated Civil Engineer Supply Store
GOQ	general office quarters
GSA	General Services Administration
HM	hazardous material
HMP	Hazardous Material Pharmacy
HVAC	heating, ventilation, and air conditioning
ICS	Infrastructure condition standard
IDIQ	indefinite delivery/indefinite quantity, a type of contract
IEC	Issue Exception Code
IEU	individual equipment unit
IL	identification list
IMPAC	International Merchant Purchase Authorization Card
IPM	integrated pest management
IWT	industrial water treatment
LP	local purchase
M&R	maintenance and repair
MADJ	Adjective File
MADT	Adjective Type File
MAJCOM	Major Command
MC	minor construction
MCP	see MILCON
MCPAM	man-hour ceiling/priority analysis method to prioritize RWP work items
MCRL	master cross reference list
MDF	material documentation folder
MFH	military family housing
MILCON	Military Construction Program (previously known as MCP)
ML-C	management data listing
MNAD	Noun Additional Description File
MNON	Noun File
MRA&C	maintenance, repair, alteration, and condition
MRL	material requirements list
MRTSUD	Rejected Transaction Suspense Program
MSDS	material safety data sheet
MSYN	Noun Synonym File
MTL	master task list

NAF	non-appropriated funds
NIIN	National Item Identification Number
NIST	not-in-stock ticket
NPI	non pre-priced
NPL	non-price listed
NSN	National Stock Number
O&M	operations and maintenance
ODBC	open database connectivity, a structure enabling communications between databases
OPR	office of primary responsibility
OSD	Office of the Secretary of Defense
PCB	polychlorinated biphenyl, a hazardous additive to some oils used as coolants in transformers
PCN	Product Control Number
PD	pier delivery
PDO	Publishing Distribution Office
PFMR	Project Funds Management Record
PHM	potentially hazardous material
PIIN	Purchase Information Identification Number
PM	preventative maintenance
PMD	property movement document
PO	purchase order
POC	point of contact
POF	Purchase Order File
POL	petroleum, oil and lubricants, AF term for organizations and systems that manage any fuel or oil-based materials
PWS	performance work statement
QAE	quality assurance evaluators, QAEs monitor service contracts.
QASP	quality assurance surveillance plan
QUP	quantity unit pack
RAC	risk assessment criteria
RC	responsibility center/cost center
RCCC	Responsibility Cost Center Code
RDD	required delivery date
RFQ	request for quote
RHA	residue holding area
RIEI	Roofing Industry Educational Institute
RIF	reduction in force
RMS	recurring maintenance schedule
RPIE	real property installed equipment, equipment CE physically installs and maintains as part of a facility
RVP	reverse post
RWP	recurring work program
SABER	simplified acquisition of base engineering requirements, IDIQ contract that performs minor construction and repair.
SBSS	Standard Base Supply System

SFM	specialty function manager
SHC	self-help center
SMART	structural maintenance and repair team
SMSgt	senior master sergeant
SOQ	senior officer quarters
SOW	statement of work
SQL	structured query language, a method for communicating between databases
SSAN	Social Security Account Number
TA	Tables of Allowances
TIB	Technical information bulletins
TIN	turn-in
TLQ	temporary lodging quarter
TO	technical order
UGT	upgrade training
UJC	Urgency Justification Code
UND	urgency of need designator
URMT	utility rates management team, an AFCESA team to support base utility engineers
WIMS	Work Information Management System, the current CE database management system
WO	work order
WRRB	Work Request Review Board (also known as WORB, Work Order Review Board)

Terms

1219 visit -- The periodic facility visit performed by a work center to identify routine work requirements and schedule a follow-on repair visit by the work center crafts. Known as the 1219 visit due to the use of the AF Form 1219, Base Civil Engineer (BCE) Multi-Craft Job Order.

acquired land -- Land obtained from any private or public source other than land withdrawn from the public domain.

acquisition -- Obtain, use, or control real property or an interest in real property by purchase, condemnation, donation, exchange, leasing, revestment, or recapture.

Air Force proponents -- Air Force major command, installation, other component or other agent designated to act on behalf of the Air Force, responsible for initiating or carrying out the proposed real property acquisition.

annexation -- A procedure by which a municipality; such as a city, town, or village, incorporates Air Force land within the corporate limits of the municipality. Procedures vary depending on state law.

as-builts -- Original facility design drawings (or replacement master drawings or the master computer aided design and drafting (CADD) drawing file). Civil Engineer units use these drawings to document all as-built conditions of a facility and modifications as they occur over the years.

Base Civil Engineer -- Senior-ranking base engineer in the Civil Engineer unit.

blanket purchase agreement (BPA) -- A simplified method of filling anticipated repetitive needs for small quantities of supplies. This agreement is designed to reduce administrative cost in making small purchases by eliminating the need for issuing individual purchase documents. The government is obligated only when a call is placed against it.

blue-line drawings -- Copies of the original as-built or design drawings used for daily work.

BPA call -- An action initiated by a Civil Engineer Material Acquisition System (CEMAS) buyer or an authorized individual to order supplies from firms that have been awarded a blanket purchase agreement.

CEMAS store work order -- A special collection work order (usually work order 00011) with work center code, cost center, cost account code, and EEIC agreed upon to be used to collect the cost of material purchased and maintained in the store.

CEMAS monitor -- The chief of Material Acquisition or designated representative who will interface between Base Contracting, Base Supply, and Accounting and Finance.

CEMAS stocked items -- Items identified or approved by the chief of Material Acquisition to be stocked for recurring demands. Approval is based on demand history, funding availability, and storage limitation.

CEMAS stock list (CSL) -- A unique number assigned to individual items listed in the noun dictionary.

certificate of necessity -- A written statement, signed by Deputy Assistant Secretary of the Air Force for Installation (SAF/MII), which certifies it is necessary (for reasons vital to the national security) for the Air Force to exceed the statutory cost limits established in AFI 32-9001 relative to annual rent or alterations, improvements, and repairs to leased buildings.

cession -- Ceding or yielding by a state of its legislative jurisdiction over government-controlled real property to the federal government.

clearance easement -- The right to remove or prevent obstructions rising into the airspace. Examples are easements over areas beyond the ends of an airfield runway (approach or departure clearance work centers). Also, easements adjacent to the sides of the runway (transition work centers), clearance for approach lighting sites, communication sites, etc. A clearance easement, specifically, does not include the right of aircraft passage over the land, so the landowner may separately recover for loss of value to his or her land due to low and frequent flights of aircraft.

commercial facilities (industrial-type) -- Air Force-owned and -operated facilities housing a function that could be done by private industry, such as motor repair shops, laundries, bakeries, ice cream manufacturing plants. (Exceptions are base exchanges, commissaries, and other non-appropriated fund activities.)

condemnation -- A judicial proceeding started by the government through the Department of Justice for the purpose of exercising its right of eminent domain. Condemnation results in passage of title and land to the government with or without the consent of the landowner, but with just compensation paid to him or her.

consideration -- Compensation or an equivalent (such as money, material, or services) that is given for something acquired or promised. This may be the appraised fair market value of the real property or may include protection of the real property against loss by fire, water, or other causes, or any mutually agreeable arrangement that does not conflict with governing statutory limitations.

core requirements -- Process oriented descriptions which describe the tasks needed to support Maintenance Engineering.

declaration of taking -- A pleading filed with a federal court of law in a real property condemnation proceeding whereby, on filing the pleading, together with deposit of estimated "just compensation" in the court, the real estate interest is vested in the government.

declaration of excess -- A narrative description of real property that is no longer required for foreseeable Air Force missions. The declaration contains an identification of the land, type of governmental real estate interest, facility inventory information, recommended disposal dates, re-use rights, and services, obligations, and outgrants outstanding (see AFI 32-9004).

direct scheduled work order -- Emergency or essential work generally not requiring detailed planning, also known as job orders.

direct digital control -- Any control system (HVAC, alarms, lighting, or otherwise) using entirely solid-state (digital) components.

District Engineer -- One of the several Division Engineers, US Army Corps of Engineers, who supervise the activities of certain District Engineers and are the intervening management level between the Chief of Engineers and District Engineers (e.g., US Army Engineer Division, North Atlantic, CENAD).

easement -- The right to use the land of another for a specified purpose. Usually, the owners of the land continue in possession and may use it as long as such use does not interfere with the purpose for which the easement was granted. An easement may be acquired for a specific term or in perpetuity. An easement differs from a license because: the privilege granted usually cannot be withdrawn during its term and it is considered to be a permanent interest in the property if the term exceeds one year.

emergency work -- Work that must be accomplished immediately.

eminent domain -- The right of the government to take private property for public use upon payment of just compensation.

Energy Conservation Investment Program (ECIP) -- A Military Construction (MILCON)-funded program primarily intended for accomplishing energy conservation retrofits of existing buildings. It includes construction of new, high-efficiency energy systems and modernization of existing systems. ECIP is an OSD centrally-managed program.

Energy Savings Performance Contract (ESPC) -- Contracting with a private sector company for completion of energy audits and installation of energy conservation projects. This provides a method to acquire energy conservation projects with no AF resources and without payment if savings do not result.

Energy Management Control System (EMCS) -- The civil engineer energy control system that historically manages heating, ventilation, and air conditioning (HVAC) systems. It differs from direct digital control in that it includes both solid state systems and the older pneumatic systems.

engineers -- Any engineer in Civil Engineer units to include the Base Civil Engineer, the Maintenance Engineer, program engineers, and project engineers.

environmental assessment -- A document, occurring early in the planning process, for evaluating the potential environmental impact of a proposed action. An assessment covers the same topical areas as an environmental impact statement (EIS), but with less detail. An assessment results in a decision that an EIS is necessary, or that the proposed action will have no significant effect, therefore, a finding of no significant impact (FONSI) can be made (AFI 32-7004).

environmental impact statement -- A detailed full-disclosure report which, pursuant to the National Environmental Policy Act (NEPA) of 1969, (42 U.S.C. 4321-4347), identifies and analyzes the anticipated environmental impact of a proposed Air Force action and discusses how the adverse effects of the proposal will be mitigated. It is prepared in two stages: a draft statement which is filed with the Environmental Protection Agency (EPA) and made available to the public for comment and a final statement which is revised to reflect comments made on the draft EIS (AFI 32-7004).

essential work -- Work that cannot wait for the next 1219 visit.

expanded clear work center easement -- The right to prohibit all uses of land, within 3,000 feet of the runway threshold and extending 1,000 to 1,500 feet on each side of the runway center line extended, that are incompatible with or could impede, aircraft operations. For additional guidance see AFI 32-7003.

facility investment metric (FIM) -- An Air Force facilities requirements identification program to assess facilities based on mission priority; used to develop funding priorities.

Federal Energy Management Program (FEMP) -- An OSD, centrally-managed program for projects less than $300K. Projects accomplish energy conservation retrofits of existing buildings or new construction plus energy audits, designs and metering programs. It includes construction of new, high-efficiency energy systems and modernization of existing systems.

fee ownership -- Title to real property belonging to a person or the government where full and unconditional ownership exists. Such ownership does not necessarily include mineral rights.

floodplain -- The 100-year floodplain is the lowland area adjoining inland and coastal waters, including flood prone areas of offshore islands that would be inundated by the base flood. The critical actions (or 500-year) floodplain is the area that would be inundated by a 500-year flood. (See AFI 32-7003.)

functional squadron -- Pre-1992 squadron structure, functionally oriented, it collocated like-functions and distribution portions of the missions and objectives to these functional shops.

general purpose space -- Space in buildings and associated land under the assignment authority of the General Services Administration (GSA) which GSA has found to be suitable for use by federal agencies, generally. The following categories of space are excluded: space in any building in a foreign country; space in any building on the grounds of a military or Coast Guard installation; space in airports; and special purpose space, as defined in GSA Federal Property Management Regulations (41 CFR 101, subpart 101-18.104-1).

grantee -- One to whom a grant is made.

grantor -- The person by whom a grant is made; a transferor of property.

GSA reimbursables -- These are special services, beyond the standard levels of service normally provided by GSA, for which the Air Force must reimburse GSA.

GSA rent -- Formerly called "standard level user charge (SLUC)," a rate charged by GSA for assigned space in government-owned or -leased property for which GSA has the assignment responsibility. The user charge approximates commercial charges for comparable space and services.

GSA space -- Space in buildings owned or leased by GSA and assigned to an Air Force or other federal government activity. This space includes land incidental to the use of the space.

hazardous substance -- This term is defined in CERCLA, 42 U.S.C. 9601 (14). For the purposes of this handbook it includes petroleum, petroleum products, oil, and lubricants (POL).

holding area -- A storage area for work order materials awaiting scheduling.

industrial facility -- Any Air Force -owned, -leased, or -controlled real property facility which is used by a contractor for the purpose of fulfilling government research, development, test, evaluation, production, maintenance, or modification contracts or for the storage of production machinery and equipment in support of such activity.

infiltration and inflow (I/I) -- Amount of water that seeps into a sanitary or storm sewer system, increasing the load on the fixed capacity pipes and treatment systems downstream.

ingrants -- Documents such as licenses, leases, permits, temporary easements, foreign base rights agreements, and treaties, under which the Department of the Air Force acquires an interest in, or control of, real property in less than fee ownership.

jurisdiction -- See legislative jurisdiction.

lease -- A conveyance of exclusive possessory interest in real property for a specified term in return for payment of rent or other consideration to the owner.

legislative jurisdiction-- This term, as used in this instruction in connection with a land area, means the power and authority of the federal government to legislate and to exercise executive and judicial powers within the area.

lessee -- One who possesses the right to occupy real property under a lease.

lessor -- One who holds title to, and conveys the right to use and occupy, a property under a lease.

license -- A privilege that can be withdrawn at will, to use or pass over a licensor's real property for a specific purpose (e.g., right-of-entry for survey and exploration, right-of-entry for construction, tree topping). Licenses merely confer a privilege to occupy real property at the sufferance of the owner. Licenses granted to other federal agencies are called permits.

life-cycle cost -- Primary criteria to be used for design (mandated by the Department of Defense); criteria of analyzing the cost over the life span of a component or system to ensure all costs are used (purchase prices, construction costs, maintainability, efficiency, reliability, etc.).

long-range plan -- Multi-year plan for projects to support a specific infrastructure element, originally termed “5-year Plan,” many bases and commands have converted to “6-year Plans” to match the two-year programming cycle.

maintainability -- Characteristic of a system describing the ease or frequency of maintenance, highly maintainable systems cost less to maintain.

maintenance engineer -- Chief of Maintenance Engineering.

MicroPaver -- Automated system used to inventory and analyze pavements.

mobilization -- The process by which the Armed Forces or part of them are brought to a state of readiness for war or other national emergency. This includes activating all or part of the Reserve Components as well as assembling and organizing personnel, supplies, and material.

National Capital Region (NCR) -- For purposes of this instruction only, a region encompassing the District of Columbia; Montgomery and Prince George's Counties in Maryland; Arlington and Fairfax, counties in Virginia; and the cities of Alexandria, Fairfax, and Falls Church in Virginia.

nonindustrial facility -- A unit of real property (other than DoD real property), including improvements. Nonindustrial facilities include hotels, motels, resort facilities, educational institutions, hospitals, office buildings, and other real property that can be used for military purposes. These type of facilities are not used or suitable for production or maintenance of materials, munitions, equipment, supplies, goods, and other products for military or civilian use ocean terminals.

non-MRL items -- Items not included in an established material requirements list (MRL). Most Contractor Operated Civil Engineer Supply Store (COCESS) contracts require the item be added to the MRL before the contractor provides the item.

non-pre-priced items (NPI) -- An item obtained for Air Force use by a COCESS contractor for which there was no prior solicited and agreed costs.

noun dictionary -- An item record list which includes item description, pricing history, demand data, and inventory data for each item loaded in CEMAS.

offer of gift (donation) -- Voluntary offer to transfer or convey to the government an interest in real property without payment or consideration of any kind by the government (AFI 51-601).

objective squadron -- Post-1992 squadron structure, objective-oriented, it purposes to collocate all functions necessary to support a mission or objective.

operations specialists -- The Air Force specialty created to support the scheduling and controlling of the Civil Engineer work forces; also known as work force manager, controller, triple-nickel, production controller, and scheduler.

option to purchase -- A contract whereby the owner of the real property gives the government the right to acquire an interest in the property at a stated price during a specified period of time. An offer to sell property, unsupported by any consideration, is not considered an option, and it may be withdrawn at anytime (10 U.S.C. 2677).

outgrants -- Documents such as leases, licenses, easements, joint-use agreements, and other agreements (including use agreements) under which the government's interest in, or control of, real property, as exercised through the Department of the Air Force, is modified by conferring rights therein to another government agency, nonfederal entity (such as a state or local government), or a private party (for such use as grazing livestock). (See AFI 32-9003.)

overhires -- Non-permanent employees hired to fulfill a specific purpose who does not fill an authorized position on the unit manning document, but is paid from civilian pay accounts and counts against the unit work-year ceiling

palace acquires-- Apprentice engineers hired by Air Force Personnel Center and managed on a central manning document; Major Commands and bases commit to a three-year training program and final job placement within the command

permit -- A nonpossessory right of exclusive or nonexclusive use of real property. When granted to a party other than a federal agency, it generally covers a one-time use and is called a "license." However, the term also is used to describe an authorization to use property under the jurisdiction of one government agency by another for a definite period. These two uses of the term must not be confused.

pre-priced items -- These are commonly used items where prices have been previously determined. This is basically what the COCESS contracts have been awarded on. The contractor agrees to provide particular items at a specified price.

pre-priced blanket purchase agreement -- Pre-negotiated BPAs established with vendors that identify specific items to be purchased at specific prices for a specific period of time. These are primarily used to reduce administrative cost and buyer time for purchasing high usage items such as CEMAS store stock.

preventative maintenance -- Recurring work performed to safeguard and/or extend the efficient and effective lifespan of real property, RPIE, or other equipment items.

program engineers -- Engineers of Maintenance Engineering, so termed because they manage infrastructure programs.

project engineers -- Engineers of the Engineering Flight, so termed because they manage projects (design and construction).

project -- As related to real estate acquisition activities, a project is a real property acquisition action, or related actions, at an Air Force installation to fulfill a known requirement. Related real property actions that constitute a complete project are processed simultaneously. (For example: The acquisition of land for an ammunition storage project usually involves the acquisition of fee ownership for the land area used to construct storage facilities and restrictive easements over an adjacent safety area.)

public domain -- Land originally acquired by the United States from foreign governments and which has never left United States ownership. It is administered by the Department of the Interior.

public lands -- Any land and interest in land owned by the United States within the states and administered by the Secretary of the Interior through the Bureau of Land Management without regard as to how the United States acquired ownership. The term excludes lands located on the outer Continental Shelf and lands held for the benefit of Indians, Aleuts, and Eskimos (43 U.S.C. 1702 (e) (see withdrawn land).

purchase request abstract -- CEMAS-generated LP requisition document used to request purchase of BCE items by the buyers.

purchase order -- A document authorizing a vendor to deliver BCE materials.

real property -- Lands, buildings, structures, utilities systems, improvements and appurtenances thereto. Includes equipment attached to and made part of buildings and structures (such as heating systems), but not movable equipment (such as plant equipment).

real estate directive -- A request to another federal agency (e.g., Office of the Chief of Engineers, US Army Corps of Engineers, Department of the Army or Naval Facilities Engineering Command, Department of the Navy or Bureau of Land Management, US Department of the Interior) to act on a real estate matter on behalf of the Air Force.

real estate -- See real property.

recurring work -- Routine, redundant, recurring work involving real property, real property installed equipment (RPIE), or systems and other equipment maintained by CE; scope and frequency is well known, locations are well established, materials are available or not required.

red-line drawings -- Marked-up drawings (typically blue-lines) indicating changes to facilities and as-built conditions, used to update as-built drawings.

release -- See CERCLA, 42 U.S.C. 9601 (22).

reliability -- Characteristic of a system that describes its anticipated lifespan and performance.

rent, nominal -- A rental consideration of a token amount in money or services. Generally, it involves a rental payment of $1.00 per year. Nominal rental also means a consideration completely unrelated to the actual or fair market value of the leased property.

request and authority to cite funds -- Base Contracting is provided a quarterly dollar target against which Base Civil Engineer local purchase items are obligated. The availability is certified by Accounting and Finance and the target amount is administered by Base Contracting. The Civil Engineer Funds Management Section should provide a complete AF Form 616, Fund Cite Authorization, to Base Contracting no later than the first working day of the quarter.

residue holding account -- An account for maintaining accountability of excess material after completing a work order.

restrictive safety easement -- The right to restrict the erection of habitable buildings, the congregation of people, or other activities within a specified safety clearance distance of munitions storage areas, armed aircraft and explosives-related facilities (see AFI 91-409).

retrocession -- The act of giving back to a state all or part of the federal legislative jurisdiction formerly enjoyed by the government.

right-of-way easement -- The right to pass over the land of another for a specific purpose. Such use could be for constructing a road, installing pipelines, pole lines, or telephone cables, etc.

right of entry -- The temporary right to enter on real property for a specified purpose without acquiring any estate or interest in it.

service contract -- A contract for nonpersonal services, executed under the Armed Services Procurement Act of 1947, where the contracting party agrees to perform some service for the Air Force and the Air Force agrees to pay for such service. In performing the service, the contractor may use real property in which he or she has an interest, even to the extent of permitting the Air Force to go on the property in a nonexclusive manner.

SLUC -- Standard Level Users Charge (see GSA rent).

stay-in-schools -- Temporarily hired employees who work a portion of the work week and attend school the rest of the week; are overhires and do not count against a manning document, pay comes from paid civilian pay and hours count against the unit work-year ceiling

space, special purpose -- Space in buildings not under assignment responsibility of the General Services Administration, including land incidental to the use thereof, that is fully or predominantly used for the special purposes of an agency having custody of such space and generally not suitable for use by other agencies. Examples of such space include computer centers, hospitals, laboratories, mints, penal institutions.

space, general purpose -- Space in buildings under assignment responsibility of the General Services Administration, including land incidental to the use thereof, that the GSA has determined to be suitable for use by federal agencies generally, **except**: space in buildings on installations of the Department of Defense or the Department of Transportation (US Coast Guard facilities) and any space designated by the GSA as special purpose space in 41 CFR 101, subchapter D, subpart 101-18.104-1.

stock record account number (SRAN) -- An accountable stock record account established for the Civil Engineer Material Acquisition Systems (CEMAS).

storage -- The holding of hazardous substances for a temporary period prior to the hazardous substances being either used, treated, transported, or disposed.

subordination agreement -- An agreement whereby the owner of a real estate interest (including subsurface oil, gas and mineral rights) agrees to suspend or limit the exercise of all or part of his or her ownership rights under specified terms and conditions (usually to avoid interference with governmental use of the surface or operations).

suspension agreement -- Suspension by lease of an individual's grazing or mineral rights in public land or state-owned lands.

urban centers -- These are the cities and standard metropolitan statistical areas (SMSA). General Services Administration is the sole leasing authority for obtaining general purpose space in these areas.

value (current, fair, and estimated) -- As used in this regulation, these terms mean current fair market value or current fair market rental value, as appropriate. Fair market value is the amount in cash, or on terms reasonably equivalent to cash, for which the property would be sold by an owner, willing but not obliged to sell, to a purchaser who desires, but is not obliged, to buy. Fair market rental value of a property is the amount that, in a competitive market, a well-informed and willing lessee would pay and that a well-informed lessor would accept for the use and occupancy of the property for a particular term.

vault -- Storage location of base as-built and Base Comprehensive Plan drawings, so termed because many bases originally stored these drawings in a vault for physical security.

wetlands -- Areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally-saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas such as mud flats, natural ponds, potholes, river overflows, sloughs, and wet meadows. Wetlands may be, but are not necessarily, located in floodplains (AFI 32-7005).

withdrawn land -- Public land that has been set aside or designated for a specific public purpose, such as a national park, wildlife refuge, or national defense use. Withdrawal of public lands generally has the effect of segregating such land from lease, sale, settlement, or other dispositions under the public land laws.

work center(s) -- Civil Engineering Operations maintenance teams organized to maintain and repair base facilities and infrastructure systems. Depending on the installation, these Centers can be classified as either shops, zones or a combination of both.

work orders -- Work requiring detailed planning or capitalization of the real property records.

Attachment 2 Core Requirements

PROCESS ORIENTED DESCRIPTION
HEAVY REPAIR

A1F.1. RECEIVES TRAINING:
A1F.1.1. RECEIVES CATEGORY 1, CLASSROOM TRAINING.
A1F.1.2. RECEIVES CATEGORY 2, HANDS-ON TRAINING.

A1F.2. PROVIDES LOGISTIC SUPPORT:
A1F.2.1. MANAGES PEST CONTROL INVENTORY.
A1F.2.2. MANAGES HAZARDOUS MATERIAL.
A1F.2.3. MANAGES BASE RECOVERY MATERIAL.

A1F.3. PERFORMS SYSTEM OPERATION:
A1F.3.1. SWEEPS AIRFIELD.
A1F.3.2. SWEEPS STREET.
A1F.3.3. SWEEPS PARKING LOT.
A1F.3.4. SWEEPS OPEN STORAGE AREA.

A1F.4. PERFORMS REAL PROPERTY MAINTENANCE:
A1F.4.1. MAINTAINS AIRFIELD:
A1F.4.1.1. INSPECTS AIRFIELD.
A1F.4.1.2. MAINTAINS AIRFIELD PAVEMENT.
A1F.4.1.3. PERFORMS FLIGHTLINE GROUNDS PEST CONTROL.
A1F.4.1.4. MAINTAINS FLIGHTLINE DITCH AND CULVERT.
A1F.4.2. OPERATES EQUIPMENT TO SUPPORT BASE ACTIVITY.
A1F.4.3. PERFORMS OPERATOR MAINTENANCE ON EQUIPMENT OR VEHICLES.
A1F.4.4. MAINTAINS ROAD:
A1F.4.4.1. MAINTAINS ROAD SURFACE.
A1F.4.4.2. MAINTAINS GUARD RAIL.
A1F.4.4.3. INSPECTS ROAD, CURB, GUTTER, DITCH, AND CULVERT FOR SHORT-TERM MAINTENANCE.
A1F.4.4.4. MAINTAINS CURB AND GUTTER.
A1F.4.4.5. MAINTAINS DITCH AND CULVERT.
A1F.4.4.6. MAINTAINS POST-MOUNTED TRAFFIC DEVICE.
A1F.4.5. PERFORMS PEST MANAGEMENT:
A1F.4.5.1. PERFORMS STRUCTURAL PEST CONTROL.
A1F.4.5.2. INSPECTS FOR PEST AND VEGETATION CONTROL.
A1F.4.5.3. PERFORMS NON-STRUCTURAL PEST CONTROL.
A1F.4.5.4. PERFORMS OTHER BASE GROUNDS PEST CONTROL.
A1F.4.5.5. PERFORMS MILITARY FAMILY HOUSING (MFH) PEST CONTROL.
A1F.4.6. PROVIDES LOCKSMITH SERVICES:
A1F.4.6.1. PERFORMS LOCKSMITH SERVICE.
A1F.4.6.2. MAINTAINS REAL PROPERTY INSTALLED VAULT AND SAFE.

A1F.4.7. MAINTAINS STORM DRAINAGE:
A1F.4.7.1. CLEANS STORM DRAIN.
A1F.4.7.2. INSPECTS STORM DRAIN FOR SHORT-TERM MAINTENANCE.
A1F.4.8. MAINTAINS DRIVEWAY, PARKING LOT, STORAGE AREA:
A1F.4.8.1. INSPECTS FOR SHORT-TERM MAINTENANCE.
A1F.4.8.2. PERFORMS MAINTENANCE ON DRIVEWAY, PARKING LOT, AND STORAGE AREA.
A1F.4.9. MAINTAINS SIDEWALK, BIKE AND JOGGING SURFACE:
A1F.4.9.1. INSPECTS FOR MAINTENANCE REQUIREMENT.
A1F.4.9.2. PERFORMS MAINTENANCE ON SIDEWALK, BIKE, AND JOGGING SURFACE.

A1F.5. PERFORMS REAL PROPERTY REPAIR:
A1F.5.1. REPAIRS AIRFIELD.
A1F.5.2. REPAIRS INTERIOR FACILITY:
A1F.5.2.1. REPAIRS FIRE PROTECTION SYSTEM.
A1F.5.2.2. REPAIRS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.5.2.3. REPAIRS GAS DISTRIBUTION SYSTEM.
A1F.5.2.4. REPAIRS CONCRETE FACILITY.
A1F.5.2.5. REPAIRS MASONRY FACILITY.
A1F.5.2.6. REPAIRS INTERIOR WATER DISTRIBUTION SYSTEM.
A1F.5.2.7. REPAIRS PLUMBING FIXTURE.
A1F.5.2.8. REPAIRS HVAC SYSTEM.
A1F.5.2.9. PERFORMS STRUCTURAL REPAIR.
A1F.5.2.10. REPAIRS STUCCO OR PLASTER FACILITY.
A1F.5.2.11. REPAIRS CERAMIC OR QUARRY TILE.
A1F.5.2.12. PERFORMS METAL WORK.
A1F.5.2.13. REPAIRS INTERIOR DRAIN, VENT, AND COLLECTION SYSTEM.
A1F.5.2.14. REPAIRS FLOOR COVERING.
A1F.5.2.15. PERFORMS MINOR PAINTING.
A1F.5.3. REPAIRS BUILDING UTILITY SYSTEM:
A1F.5.3.1. REPAIRS FIRE PROTECTION SYSTEM.
A1F.5.3.2. REPAIRS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.5.3.3. REPAIRS GAS DISTRIBUTION SYSTEM.
A1F.5.3.4. REPAIRS HVAC SYSTEM.
A1F.5.3.5. REPAIRS MEDICAL PIPING SYSTEM.
A1F.5.3.6. REPAIRS ELECTRICAL APPLIANCE OR EQUIPMENT.
A1F.5.3.7. PERFORMS METAL WORK.
A1F.5.3.8. REPAIRS COMPRESSED AIR DISTRIBUTION SYSTEM.
A1F.5.4. OPERATES EQUIPMENT TO SUPPORT BASE ACTIVITY.
A1F.5.5. REPAIRS ROAD:
A1F.5.5.1. REPAIRS ROAD SURFACE.
A1F.5.5.2. REPAIRS CURB AND GUTTER.
A1F.5.5.3. REPAIRS DITCH AND CULVERT.
A1F.5.6. REPAIRS EXTERIOR FACILITY:
A1F.5.6.1. REPAIRS PLUMBING FIXTURE.

A1F.5.6.2. REPAIRS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.5.6.3. REPAIRS CROSS-CONNECTION CONTROL AND BACKFLOW.
A1F.5.6.4. PERFORMS STRUCTURAL REPAIR.
A1F.5.6.5. REPAIRS CONCRETE FACILITY.
A1F.5.6.6. REPAIRS MASONRY FACILITY.
A1F.5.6.7. REPAIRS STUCCO OR PLASTER FACILITY.
A1F.5.6.8. REPAIRS CERAMIC OR QUARRY TILE.
A1F.5.6.9. PERFORMS METAL WORK.
A1F.5.7. REPAIRS STORM DRAIN.
A1F.5.8. REPAIRS FENCE.
A1F.5.9. REPAIRS DRIVEWAY, PARKING LOT, AND STORAGE AREA.
A1F.5.10. REPAIRS SIDEWALK, BIKE, AND JOGGING SURFACE.

A1F.6. PERFORMS REAL PROPERTY ALTERATION:
A1F.6.1. ALTERS BUILDING UTILITY SYSTEM:
A1F.6.1.1. ALTERS FIRE PROTECTION SYSTEM.
A1F.6.1.2. ALTERS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.6.1.3. PERFORMS METAL WORK.
A1F.6.1.4. ALTERS HVAC SYSTEM.
A1F.6.1.5. ALTERS ELECTRICAL APPLIANCE OR EQUIPMENT.
A1F.6.2. ALTERS INTERIOR FACILITY:
A1F.6.2.1. ALTERS STRUCTURE.
A1F.6.2.2. ALTERS CONCRETE FACILITY.
A1F.6.2.3. ALTERS MASONRY FACILITY.
A1F.6.2.4. ALTERS STUCCO OR PLASTER FACILITY.
A1F.6.2.5. ALTERS CERAMIC OR QUARRY TILE.
A1F.6.2.6. ALTERS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.6.2.7. PERFORMS METAL WORK.
A1F.6.2.8. ALTERS HVAC SYSTEM.
A1F.6.3. ALTERS EXTERIOR FACILITY:
A1F.6.3.1. PERFORMS STRUCTURAL ALTERATION.
A1F.6.3.2. ALTERS CONCRETE FACILITY.
A1F.6.3.3. ALTERS MASONRY FACILITY.
A1F.6.3.4. ALTERS STUCCO OR PLASTER FACILITY.
A1F.6.3.5. ALTERS CERAMIC OR QUARRY TILE.
A1F.6.3.6. ALTERS PLUMBING FIXTURE.
A1F.6.3.7. ALTERS LOW VOLTAGE ELECTRICAL SYSTEM.
A1F.6.3.8. PERFORMS METAL WORK.
A1F.6.3.9. ALTERS CROSS-CONNECTION, CONTROL, AND BACKFLOW.
A1F.6.3.10. PERFORMS MINOR PAINTING.
A1F.6.3.11. ALTERS IRRIGATION SPRINKLER SYSTEM.

A1F.7. PERFORMS REAL PROPERTY CONSTRUCTION:
A1F.7.1. OPERATES EQUIPMENT TO SUPPORT COMMUNICATION SCHEMES.
A1F.7.2. PERFORMS STRUCTURAL CONSTRUCTION:
A1F.7.2.1. CONSTRUCTS FACILITIES.

A1F.7.2.2. INSTALLS UTILITY SYSTEMS.
A1F.7.2.3. OPERATES EQUIPMENT.
A1F.7.3. CONSTRUCTS ROAD.
A1F.7.4. CONSTRUCTS FENCE.
A1F.7.5. CONSTRUCTS DITCH, CULVERT, STORM DRAIN, AND SUB-SURFACE DRAIN.
A1F.7.6. CONSTRUCTS CURB OR GUTTER.
A1F.7.7. CONSTRUCTS DRIVEWAY, PARKING LOT, OR STORAGE AREA.
A1F.7.8. CONSTRUCTS SIDEWALK, BIKE, OR JOGGING SURFACE.